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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/520,122

Applicant(s)

VOSAHLO, JINDRICH

Examiner

DAVID BANH

Art Unit

2854

Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 April 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) See Continuation Sheet is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3-6,10,12,14,15,25,28,29,33,36,38,40,42,47,50,68,76,78 and 81-83 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-940)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

Continuation of Disposition of Claims: Claims pending in the application are 1,3-6,10,12,14,15,25,28,29,33,36,38,40,42,47,50,68,76,78 and 81-83.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to claims 1, 3-6, 10, 12, 14, 15, 25, 28, 29, 33, 36, 38, 40, 42, 47, 50, 68, 76, 78 and 81-83 have been considered but are moot in view of the new ground(s) of rejection.

Claim 1 has been amended to include that the deposition of ink occurs with an inkjet head. The rejection based on Sachs has been revised accordingly with the newly cited reference brought in to overcome the changes brought upon by amendment.

With respect to claim 38, Applicant argues that claim 38 recites "a print head arranged to deposit a second pass of ink on a second sub-area adjacent to the first sub-area, wherein only a minor part of the second pass of ink is deposited on top of partially cured ink deposited on the substrate including the first pass of ink.", and that Cleary et al. does not teach this feature. However, the recitation that the print head is arranged to deposit the second pass of ink is functional language which does not modify the structure of the printer. Cleary et al. recites a plurality of print heads which can constitute first and second print heads, and the print heads are capable of depositing ink on the substrate and are capable of depositing ink in multiple passes such that the passes overlap slightly. Additionally, it is believed that, in ink jet printing, ink of a plurality of passes must necessarily slightly overlap to produce an image which is free of any void zones represented by thin lines between the passes.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claim 68 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 68 recites a particular structure to perform the function of the means for partial curing recited in parent claim 38. Taken together with the parent claim, claim 68 renders uncertain whether or not the means for language of claim 38 is intended to invoke 35 U.S.C. 112, sixth paragraph.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

5. Claims 29, 38, 40, 42, 47, 50, 68 and 76 are rejected under 35 U.S.C. 102(e) as being anticipated by Cleary et al. (US Patent 6,457,823).

For claim 29: Cleary et al. teaches a method of printing an area of a substrate with a plurality of passes using radiation curable ink (see Fig. 6, see column 5, lines 30-35, sequence of paths **54**, each path cured with UV radiation) comprising depositing a first pass of ink **54-1** on a first sub-area of the area using radiation curable ink (see Fig. 6), substantially immobilizing the ink of the first pass in a first curing step (column 5, lines 5-15, setting the ink so it does not curl as shown in Fig. 5), wherein the immobilized ink is such that it is substantially wettable by ink of a subsequent path (this limitation is not a step, however, as the ink is not fully cured, it is wettable by subsequent ink), and depositing a second pass of ink **54-2** adjacent to the first sub-area in a second sub-area (see Fig. 6), by using radiation curable ink (see column 5, lines 45-50, the ink of the reference is radiation curable ink), wherein only a minor portion of the second pass of ink is deposited on top of the partially cured ink of the first pass (see Fig. 6, and column 4, lines 35-48, the ink swaths have overlap regions, additionally, ink printed by ink jet in swaths must slightly overlap to prevent unprinted line regions from appearing between the swaths).

For claim 38: Cleary et al. teaches an apparatus (see Fig. 2A and Fig. 2B) for an inkjet device, for use in printing an area of a substrate with a plurality of passes of radiation curable ink (see Fig. 6, and further the ink is radiation curable as taught in column 5, lines 45-50), the apparatus comprising a printhead **28-1** arranged to deposit a first pass of ink using radiation curable ink on a first sub-area of the area (see Fig. 2A), means for partially curing **24-1** the ink deposited on the area wherein the means for partially curing the ink is adapted to cure the ink such that an exposed surface of the

partially cured ink is in non-solidified form (see column 5, lines 5-15, the radiation sources only partially cures the ink to set it, thus the ink is not yet in solidified form), a print head **28-2** arranged to deposit a second pass of ink adjacent to the first sub-area and means for substantially fully curing the ink on the area (see column 6, lines 40-45). The recitation "wherein only a minor part of the second pass of ink is deposited on top of a partially cured ink deposited on the substrate including the first pass of ink" is functional language directed to the intended use of the second print head. The second print head **28-2** is capable of depositing ink on a second sub-area of the substrate, and further capable of depositing some ink on top of ink deposited by a first pass of ink (see column 4, lines 33-40, inks may be deposited over each other to form composite colors, such as green, whereas in Fig. 6, ink swaths are deposited, but are capable of being deposited such that their edges overlap very slightly to prevent lines from appearing between ink swaths).

For claim 40: Cleary et al. teaches the apparatus according to claim 38 wherein the means for partially curing the ink is adapted to cure the ink such that an exposed surface of the partially cured ink is in substantially liquid or gel form (see column 5, lines 5-15, the ink is only cured to set, but is only given 5% of the energy required to fully cure, leaving the ink in a non-hardened quasi-fluid state, see claim 11 of Cleary et al., which is interpreted as a gel form).

For claim 42: Cleary et al. teaches the apparatus of claim 38 wherein the means for partially curing the ink is adapted to at least partially cure the ink adjacent the substrate (see column 5, lines 5-15, the ink is cured to set and prevent dot gain or loss).

For claim 47: Cleary et al. teaches the apparatus of claim 38 wherein the means for partially curing the ink **24-1** is separate from the means for fully curing the ink **200** (see Fig. 11).

For claim 50: Cleary et al. teaches the apparatus of claim 38 wherein the radiation output of the radiation source is capable of being varied (the radiation source is at least capable of being varied between two states, on and off). The Specification of the present application does present any particular structure tied to the means for varying the output of the radiation source beyond the radiation source itself.

For claim 68: Cleary et al. teaches the apparatus of claim 38 wherein an LED is adapted to emit radiation toward the ink (see column 6, lines 30-35).

For claim 76: Cleary et al. teaches an ink jet device including an apparatus as taught in claim 38 for printing on an area of a substrate using ink (see rejection of claim 38 above), wherein the device comprises a printer carriage **18** having one or more print heads **28-1** (see Fig. 2A, and column 6, lines 35-55) and a radiation source **24-1** for partially curing ink emitted by one or more of the print heads **28-1** and a radiation source **200** for fully curing the ink, wherein the radiation source **24-1** for partially curing the ink is arranged to move with one or more of the print heads **28-1** and the radiation source **200** for substantially curing the ink is arranged such that one or more print heads **28-1** can move relative to the radiation source **200** (see Fig. 2A, the radiation source for partially curing moves with the print head in the carriage and Fig. 11, the fully curing radiation source is separate so the carriage can move relative to it).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1, 3-6, 12, 14, 15, 25, 28 and 83 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sachs (US Patent 4,309,452) in view of Sawatsky (US PG Pub 2002/0064616).

For claim 1: Sachs teaches a method comprising depositing a first layer of radiation curable material (see column 3, lines 5-10) onto the substrate in a first pass on the area (see column 3, lines 23-24), partially curing the material deposited in the first pass such that an exposed surface is in non-solidified form (column 3, lines 29-35, "partially uncured and somewhat tacky, gelled), depositing a second layer onto the area (see column 3, lines 40-43) and completely curing the area (column 3, lines 43-46).

Sachs does not teach depositing the layers with an ink jet head in the form of a plurality of spaced apart droplets for depositing the first and second layers. However, Sawatsky teaches the use of DIJ (direct ink jet printing) to be used in the application of surface coatings onto substrates (see paragraph 84), wherein the surface coatings are comprised also of UV curable materials (see paragraph 80), being UV curable inks as they are deposited by an ink jet head. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use digital ink jet printing as taught by Sawatsky to deposit the first and second passes as in Sachs, being then comprised

of separate droplets of ink, for the purpose of attaining the advantage of allowing quick computer controlled changes to the pattern and quantity of the material applied.

For claim 3: The combination of Sachs and Sawatsky teaches the method of claim 1 and Sachs teaches that the partial curing step is such that an exposed surface of the partially cured ink is in substantially gel form (column 3, lines 30-33, and claim 1, section(a) in column 5, lines 10-15).

For claim 4: The combination of Sachs and Sawatsky teaches the method of claim 1 and Sachs teaches that the exposed surface of the partially cured ink is prevented from solidifying by oxygen inhibition (see column 3, lines 40-45, a low oxygen environment is provided in the same manner as in the present application).

For claim 5: The combination of Sachs and Sawatsky teaches the method of claim 1 and Sachs teaches that the partial curing step effects at least a partial curing of the ink adjacent to the substrate (see column 3, lines 28-32, the ink is cured throughout a portion of its thickness but not the substrate, so the ink near the surface is the portion partially cured).

For claim 6: The combination of Sachs and Sawatsky teaches the method of claim 1 and Sachs teaches that the partial curing step causes at least partial curing of the ink (see column 3, lines 28-32) such that the partially cured ink is stable after a period of minutes (see column 3, lines 30-35, the ink is partially cured and tacky and thus can be considered stable).

For claim 12: The combination of Sachs and Sawatsky teaches the method of claim 1 and Sachs teaches that the ink comprises UV curable ink (see column 4, lines

45-50, UV curable is discussed here, radiation curable is used as the term in the rest of the reference).

For claim 14: The combination of Sachs and Sawatsky teaches the method of claim 1 and Sachs teaches the use of ultraviolet light in curing (see column 4, lines 44-45), which is light having wavelengths between 10 nm and 400 nm. Therefore, Sachs teaches a range which overlaps with the claimed range of ultraviolet light having a wavelength of greater than 370 nm.

For claim 15: The combination of Sachs and Sawatsky teaches the method of claim 1 wherein the fully curing step comprises providing a low oxygen environment (see column 3, lines 40-45).

For claim 25: The combination of Sachs and Sawatsky teaches the method of claim 1 and Sachs teaches that the partially cured ink is such that at least a part of the ink can be displaced by rubbing (see column 3, lines 34-36, the surface is tacky, so it can be smeared by rubbing).

For claim 28: The combination of Sachs and Sawatsky teaches the method of claim 1 and Sach teaches wherein the first pass of ink is such that it is wetted by the ink of the second pass (column 3, lines 40-45, the second layer is applied to the first layer, so there is contact between the layers, so the ink of the first pass is wetted by the ink of the second pass).

For claim 83: The combination of Sachs and Sawatsky teaches the method of claim 1 wherein the second pass of ink is applied on top of the first pass (see column 3, lines 40-45).

8. Claims 10, 33 and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sachs (US Patent 4,309,452) and Sawatsky (US PG Pub 2002/0064616) as applied to claim 1 above, and further in view of Cleary et al. (US Patent 6,457,823).

For claim 10: The combination of Sachs and Sawatsky teaches all of the limitations of claim 10 except that the step of partially curing the ink is effected by a first device and the step of fully curing the ink is effected by a second device separate from first device. However, Cleary et al. teaches within a method of curing ink, a first partial curing step effected by a first curing device **24-1** (see Fig. 2, and column 4, lines 60-65) and a second curing step effected by a second curing device **200** separate from the first curing device (see Fig. 11 and column 6, lines 40-50). It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide two separate curing devices for partial and full curing steps respectively as taught by Cleary et al. for the purpose of increasing the production speed by allowing new products to be produced and partially cured while previously partially cured products are fully cured separately downstream.

For claim 33: The combination of Sachs and Sawatsky teaches all of the limitations of claim 1 wherein the ink is at least partially cured using a first radiation source and the ink is fully cured using a second radiation source, although the combination is not explicit that the radiation sources are distinct. The combination does not teach that the emitting of the ink is done using a printer carriage having one or more print heads, and wherein the first radiation source is arranged to move with the print heads while the second is arranged such that the print heads can move relative to the

second radiation source. However, Cleary et al. teaches emitting of ink done by a printer carriage **18** having one or more print heads **28-1** (see Fig. 2A) and wherein first radiation means for partially curing **24-1** the ink are arranged with the print heads **28-1** while a second radiation source **200** for substantially fully curing the ink is arranged such that one or more printheads **28-1** can move relative to said second source **200** (see Fig. 11 and column 6, lines 40-50). It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide a printer carriage having the ink print heads for emitting ink for the purpose of being able to easily move the print heads to their necessary position to deposit ink and to provide separate curing devices for partial and full curing steps respectively as taught by Cleary et al. thus producing products in a linear assembly line fashion where each step is performed by a separate device arranged sequentially for the purpose of increasing production speed and producing more products at a faster rate.

For claim 36: The combination of Sachs and Sawatsky teaches all of the limitations of claim 36 except that an LED is used to emit radiation toward the ink. However, Cleary et al. teaches the use of an LED to emit ultraviolet light towards the ink to effect a partial cure of the ink (column 2, lines 3-10). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use an LED to emit the curing light for the purpose of saving on costs as LEDs are cheaper, lighter and more energy efficient means for emitting ultraviolet light.

9. Claim 78 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cleary et al. (US Patent 6,457,823) in view of Codos (US PG Pub 2002/0024544).

For claim 78: Cleary et al. teaches all of the limitations of claim 78 except a beam movable with respect to the area of the substrate and the printer carriage being adapted to move along and with the beam wherein the radiation source for fully curing the ink and the beam are adapted to be relatively movable. However, Codos teaches an ink jet printer (see Fig. 1) comprising a beam **128** that carries a printer carriage **130** that is adapted to move along the beam **128** in direction **113** (see paragraph 21) as well as with the beam **128** in direction **112** (see Fig. 1A, and paragraph 38, at least in one embodiment, the beam is movable with respect to the paper and the carriage moves with the beam, to allow the ink jets to be incremented to produce a higher print quality and resolution). It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide a beam movably along a length of the substrate with the print head moving along the beam and with the beam as taught by Codos for the purpose of allowing the ink jet to increment against the paper to produce a higher print quality and resolution by having moving the ink jet in a controlled and indexed position relative to the paper. In the combination of Cleary et al. and Codos, as recited above, the beam is independently movable and separate from the curing station for fully curing **200**, and thus the fully curing means and the beam are relatively movable.

10. Claim 81 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sachs (US Patent 4,309,452) and Sawatsky (US PG Pub 2002/0064616) as applied to claim 1 above, and further in view of Troue (US Patent 4,485,123).

For claim 81: The combination of Sachs and Sawatsky teaches all of the limitations of claim 81 except that the partial curing step includes a step of varying the level of cure depending on the rate of printing. However, Troue teaches a method of producing a coated product with first a partial cure of the coat and then a subsequent full cure of the coat, comprising varying the level of partial cure depending on the rate of printing (see column 16, Table II, the various examples show a fixed number of lamps with different speeds, which would vary the amount of cure with the speed) to change the appearance of the cured product. It would have been obvious to one of ordinary skill in the art at the time the invention was made to vary the level of cure depending on the printing rate as taught by Troue in the method of Sachs for the purpose of controlling the appearance of the final product.

11. Claim 82 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sachs (US Patent 4,309,452), Sawatsky (US PG Pub 2002/0064616) and Troue (US Patent 4,485,123) as applied to claim 81 above and in further view of Matthews et al. (US Patent 4,313,969).

For claim 82: The combination of Sachs, Sawatsky and Troue teaches The method of claim 81 except that the dose of curing radiation applied to a region of ink is varied so to vary the level of gloss of ink on the area. However, Matthews et al. teaches a varying the radiation output of a radiation source 5 to control the gloss of cured ink (column 3, lines 40-50, teaches the concept, and column 4, lines 44-46 teaches a control panel 25). It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate a means for controlling the radiation to

control the gloss of the coat of produced products for the purpose of producing a more aesthetically pleasing coated product.

Conclusion

12. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **DAVID BANH** whose telephone number is (571)270-3851. The examiner can normally be reached on **M-F 9:30AM - 8PM**.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, **Judy Nguyen** can be reached on (571)272-2258. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

DHB

/Judy Nguyen/
Supervisory Patent Examiner, Art Unit 2854